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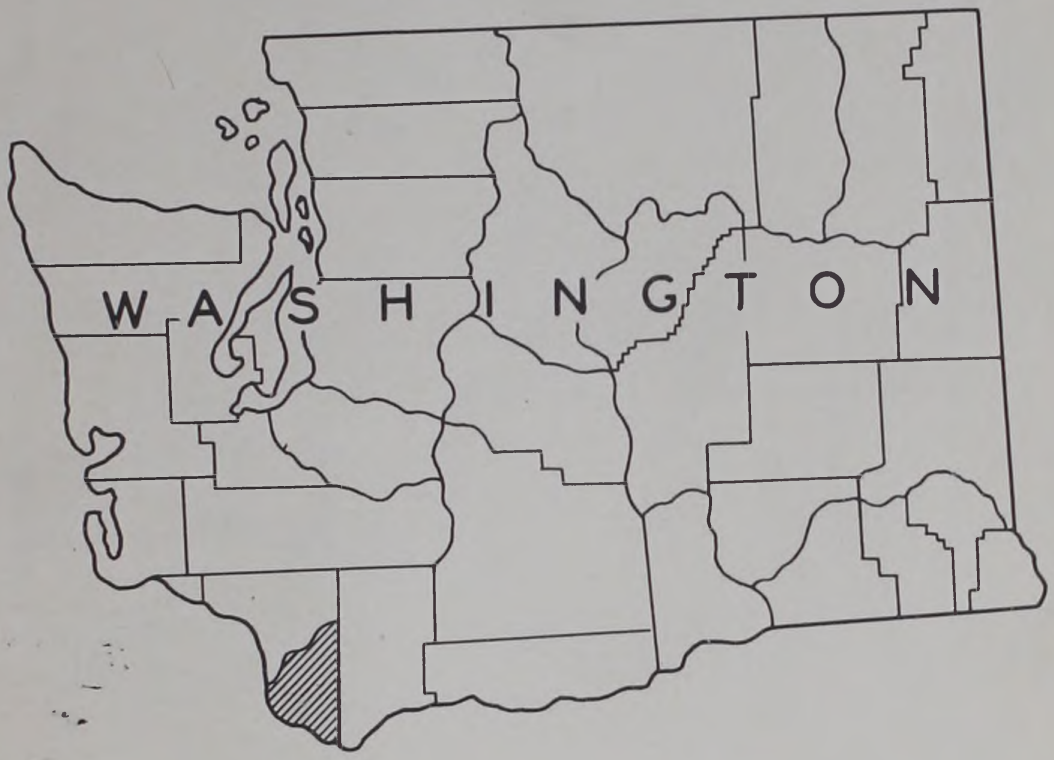
EXPERIMENT STATION

FOREST STATISTICS
FOR
CLARK COUNTY, WASHINGTON

FROM THE FOREST SURVEY INVENTORY REVISED IN 1943

FOREST SURVEY REPORT NO. 94



U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE
PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION
STEPHEN N. WYCKOFF, DIRECTOR

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PORTLAND, OREGON DECEMBER, 1944

FIGURE 1

OUTLINE MAP
OF
CLARK COUNTY, WASHINGTON
1943

Forest Statistics Summarized

Total land area (acres)	405,720
Forest land area (acres)	241,285
Conifer saw timber	16,195
Second growth conifer	150,010
Hardwood	7,320
Deforested cutovers and burns	67,760
Saw-timber volume (in millions of board feet)	641
Old-growth Douglas-fir	165
Large second-growth Douglas-fir	208
Small second-growth Douglas-fir	243
Other species	25
Site Quality of commercial conifer area (Percent of 233,965 acres)	
Site class I	1.5
Site class II	76.8
Site class III	20.3
Site class IV	1.4
Total	100.0
Degree of stocking in immature conifer types (acres)	
Good (70 to 100 percent of full stocking)	37,155
Medium (40 to 69 percent of full stocking)	66,490
Poor (10 to 39 percent of full stocking)	46,365
Total	150,010
Average annual saw-timber depletion, 1940-43 (In millions of board feet)	34.5
Sawlog production	19.5
Fuelwood and other minor products (estimated)	15.0
Current annual growth (in millions of board feet)	31.2

FOREWORD

The forest survey, a Nation-wide project, consists of a detailed investigation in five major parts of present and future forest resources: (1) An inventory of the country's existing forest resources in terms of areas occupied by forest-cover types and of timber volumes, by species, in board feet and cubic feet, and a study of conditions on cut-over and on burned forest lands; (2) a study of the depletion of the forests through cutting and through loss from fire, insects, disease, and other causes; (3) a determination of the current and potential growth on forest areas; (4) an investigation of present and prospective requirements of the United States for forest products; and (5) an analysis and correlation with other economic data of findings of these studies in order to make available basic facts and guiding principles necessary to plan for sound management and use of forest resources.

The forest survey of Oregon and Washington, an activity of the Pacific Northwest Forest and Range Experiment Station, was conducted in the Douglas-fir region during the period 1930-33. 1/ In 1937 work of keeping the survey up to date was commenced in counties in which there had been a large amount of cutting depletion since the original survey.

The inventory phase of the survey was conducted in Clark County, Washington, in 1931 and a statistical report summarizing the results and a detailed forest type map were issued. In 1943 a reinventory of the county's forests was made to bring the statistical data and type map up to date. Adjustments, based on field examination, were made for changes in forest-type acreages and timber volumes due to logging and fire, restocking of cut- and burned-over areas, and transfer of land ownership since the original inventory. Revised statistics are given in this report and prints of the revised type map may be obtained. 2/

1/ Oregon and Washington were divided for survey purposes into two regions; (1) Douglas-fir region, consisting of that part of both states west of the Cascade Range summit, and (2) ponderosa pine region, that part of both states east of the Cascade Range summit. A regional report which includes an interpretation of the forest survey data and analysis of the forest situation has been published for each of the two regions.

2/ For information on the detailed 1-inch-to-the-mile forest type map of the county or the 1/4-inch-to-the-mile lithographed state type maps covering Oregon and Washington, address Director, Pacific Northwest Forest and Range Experiment Station, 423 U. S. Court House, Portland 5, Oregon.

FOREST STATISTICS FOR CLARK COUNTY, WASHINGTON

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1. Outline map of Clark County, Washington — Inside cover

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FOREST STATISTICS FOR CLARK COUNTY, WASHINGTON

By G. S. Meagher[1/]

Though Clark County contains a relatively small land area, ranking 34th among Washington counties, it is the leading agricultural county of southwestern Washington. Clark was the first county organized in what is now the State of Washington and its present economic and social pattern is the result of well over 100 years of white settlement and development.

Agricultural expansion took place relatively early; most of the level and rolling lands, which account for about half of the total land area, have been devoted to farm use for 50 years or longer. Leading farm occupations in 1940 were dairying, poultry raising, fruit and nut growing, hay and forage production, and truck gardening, in about that order.

Industrially, Clark County has maintained a steady growth in the processing of dairy, fruit and vegetable products, and in the conversion of wood into lumber, pulp, and plywood. Vancouver, with excellent transportation facilities by water, rail, and highway, is the principal industrial center and the county seat. During the war, industrial activity and population in the Vancouver area have both increased tremendously with the addition of a large shipyard and an aluminum reduction plant.

Clark County was the scene of the first sawmill operation located west of the Mississippi River. This first small mill was built by Dr. John McLaughlin of the Hudson's Bay Company in 1827. Located near the present site of Vancouver, it was water-driven, with a reported daily output of 3,000 board feet.

Early logging activity was confined to the areas bordering the rivers and larger streams where logs could be yarded directly to the river bank, and driven or rafted to the nearest sawmill. When large-scale railroad operations first entered the region near the turn of the century, the bulk of Clark County's foothill and mountain lands remained heavily timbered. The historic Yacolt fire of 1902 destroyed probably half of the old-growth timber of these lands; logging and later fires have since accounted for most of the remainder. Logging activity reached its peak between 1910 and 1920 and has declined appreciably since 1929, most of the large bodies of saw timber having been exhausted.

1/ George E. Morrill assisted in the field work. Office compilation was by Inga E. Fulkerson, Dorothy L. Masche, and E. R. Grosh.

The original forest inventory of 1931 and the reinventory of 1943 form the basis for the following statistical information on the character, extent, and present condition of Clark County's forest resource.

Physical Character of County

Situated in southwestern Washington, Clark County is roughly 25 miles square and covers 405,720 acres. It borders the Columbia River for about 40 miles and includes all the land between the Columbia and Lewis Rivers from their junction on the west to the lower reaches of the Cascade Range on the east (Fig. 1). Alluvial bottomlands, subject to periodic overflow, form a narrow strip along the Columbia River. Level to rolling terrace lands extend 5 to 18 miles further inland and terminate rather abruptly in the foothills of the Cascades which cover the east and northeast portions of the county.

The bottom and terrace lands, with an altitudinal range of 100 to 600 feet, form the main agricultural zone, and present a varied pattern of pasture, cultivated field, orchard, and woodland. The foothills adjacent to the agricultural zone are fairly low and rounded, rising to elevations of 1,000 and 1,500 feet. Further east, the mountains are 1 to 2 thousand feet higher and more broken. The highest point in the county is reached near the head of Rock Creek with an elevation of slightly over 4,000 feet.

The southern half of the county is drained by three minor tributaries of the Columbia River; the northern half drains into the Lewis River through Cedar Creek, Canyon Creek, and the East Fork of the Lewis River. Lake Merwin, an artificial lake used for generating hydroelectric power, extends along the north boundary of the county for a distance of about 11 miles.

The climate is generally humid and temperate, characterized by heavy rainfall during the fall and winter months, a long growing season, and slight temperature fluctuations. Mean average precipitation varies from 37 inches at Vancouver to 76 inches at Yacolt; it probably exceeds 100 inches in the high mountains along the east boundary. The frost free period ranges from about 160 days in the mountains to slightly over 220 days at Vancouver.

Character of the Forests

Altogether, forest types cover 241,000 acres, representing 60 percent of the total land area. The north and east sections of the county contain about four-fifths of the forest area in one almost continuous block; small tracts, widely scattered throughout the agricultural zone, make up the other fifth.

In the survey, 14 forest types were recognized and mapped in place; 7 are conifer, 3 are hardwood, and 4 are denuded forest land. The area of each individual type is presented in table 1. Forest type

information in a more generalized form is given graphically in figure 1 and statistically in table 2. Roughly, 7 percent of the forest area is occupied by conifers of saw-timber size, 62 percent by conifers below saw-timber size, 3 percent by hardwoods, and 28 percent is currently deforested.

Climate, soil, and topography combine to favor the development of Douglas-fir over all other tree species in the county. It predominates in all saw-timber types, and on 98 percent of the area in immature conifers. Douglas-fir often forms practically pure stands; in mixed stands, grand fir, western redcedar, and western hemlock are most frequently associated.

Conifers of Saw-timber Size

Large, old-growth Douglas-fir (type 6), which prevailed over most of the forest zone prior to the Yacolt fire, now covers some 6,000 acres, representing only 2½ percent of the total forest land. The largest block, containing about 1,500 acres, is found in the Canyon Creek basin; smaller remnant stands occur on Larch Mountain and in the hills south of Lake Merwin.

Small, old-growth Douglas-fir (type 7) is found on only a few hundred acres, made up of several small tracts in the agricultural zone.

In terms of both type area and merchantable volume, stands of large, second-growth Douglas-fir (type 8) now form the most important saw-timber type. Varying in age, from 70 to 140 years and in diameter from 22 to 40 inches, type 8 stands cover about 10,000 acres. This class of timber has furnished a large share of the saw-timber cut in recent years; the area remaining is mostly included in one large block extending from the Canyon Creek drainage to Chelatchie Prairie.

Immature Conifers

Coniferous stands of pole size (6 to 20 inches d.b.h.) are the characteristic forest cover of the agricultural zone, where they occupy most of the areas too steep, rocky, sterile, or too poorly drained for cropland or pasture use. Individual stands seldom cover more than one or two hundred acres and they are usually intermingled with orchards, pastures, and cultivated fields. Practically all of the pole-size stands in the agricultural zone are readily accessible, and they have been extensively cut for cordwood, posts, poles, and small sawlogs.

More extensive pole-size stands are found around the fringes of the agricultural zone, in the low hills between Cedar Creek and Lake Merwin, and adjacent to Siouxon Creek in the extreme northeast corner of the county.

Altogether, pole stands cover almost 70,000 acres, representing 29 percent of the forest land in the county. Douglas-fir (type 9) predominates on all except 1,700 acres where either western redcedar (type 19) or grand fir (type 30) attain the majority.

Ages of the pole stands vary from 20 to 70 years, with the largest type acreage found in the 30, 40, and 50 year classes (table 3). By area, about 45 percent originated following cutting; the remainder either restocked following fires or seeded in on abandoned fields or pastures. Tree density in stands of pole size is generally good, with 86 percent of their area medium stocked or better.

Conifers of seedling and sapling size (less than 6 inches d.b.h.) are found on slightly over 80,000 acres, and account for about one-third of the forest land. The largest concentrations are located in the main forest zone--on the old cutovers east and west of Yacolt and in the burns of the Rock Creek basin further south. Smaller tracts are widely scattered in all parts of the county. Except for 500 acres, where western redcedar (type 19) occurs in the majority, Douglas-fir (type 10) predominates in all seedling and sapling stands. Ages vary from 10 to 30 years, but three-quarters of these stands, by area, became established since the original inventory and were placed in the 10 year class. Density of seedlings in the newly established stands is, in general, far from satisfactory (table 3). About half of their area is poorly stocked, two-fifths is of medium stocking, and only one-tenth is well stocked. Restocked cutovers account for three-fifths of the area in seedling and sapling stands with two-fifths consisting of restocked burns.

Hardwoods

Although red alder and bigleaf maple often occur as understory trees in the conifer stands of saw-timber size, hardwood species predominate on only 7,200 acres. Stands of red alder, which account for about four-fifths of the hardwood area, occur on the north-facing slopes near Lake Merwin, and as long stringers following the streams in other parts of the county. Black cottonwood, Oregon ash, bigleaf maple, and Oregon white oak are the key species of small areas in the agricultural zone. Only 400 acres of hardwoods contain merchantable trees 12 inches in d.b.h. or larger (type 31.5); the remainder is stocked with smaller immature trees (type 31).

Recent Cutovers

In the survey, areas clear-cut since 1930, aggregating about 8,000 acres, were classed as recent cutovers (type 36). Due to the relatively short period that has elapsed since much of the area was cut, no examination to determine restocking status was made. Logging activity in recent years has been largely centered in the Chelatchie Prairie vicinity. The cut-over tracts are relatively small and intermingled

with blocks of green timber. They should restock within a reasonable period if adequately protected from fire. Clear cutting has been the prevailing practice and only a relatively small area has been selectively logged.

Nonrestocked Lands

In the reinventory, 60,000 acres, representing one-quarter of the forest land in the county, were found to be nonrestocked and currently nonproductive. These lands are of three classes: Areas cut over prior to 1920 (type 35), areas cut over between 1920 and 1929 (type 35A), and burns (type 37).

Of some 77,000 acres cut over prior to 1920, about 9,000 are still nonrestocked. Two large blocks, one located east of Yacolt, and the second in the watershed of the Little Washougal River, make up the bulk of the type area.

In the decade 1920-29, about 16,000 acres were cut over. Slightly over 5,000 acres, or one-third of these lands remained deforested in 1943. The largest area of type 35A covers the south-facing slopes of Yacolt Mountain. Smaller tracts are located north of Yacolt, and on Green Mountain in the southern part of the county.

Deforested burns, which aggregate about 45,000 acres, account for three-quarters of the land in the nonrestocked category. Several very large areas of type 37 are found in the east central and extreme northeast portions of the county; areas that were deforested originally by the Yacolt fire in 1902 and reburned in either the Dole fire of 1929 or in other smaller fires. Parts of these areas have reburned as many as 4 or 5 times in a period of about 30 years.

The present condition of these large nonrestocked cutovers and burns is largely due to the extent and frequency of reburns and to a rapidly diminishing seed supply.

Productive Capacity of the Forest Land

In the survey, all forest lands except those currently occupied by hardwoods were rated according to their capacity to grow Douglas-fir. The resulting statistics on site quality (table 4) place Clark County's forest land among the most productive in the Douglas-fir region. Of the 234,000 acres classified, slightly over three-quarters is site class II, a site of better than average productivity; one-fifth is site class III, and the remainder is about evenly divided between site classes I and IV. No areas of the least productive class, site V, were found. The site quality data were used in computing the volume of the immature conifer stands, in estimating the rate of growth of second-growth stands, and in estimating the potential growth capacity of all the forest land in Clark County.

Saw-Timber Volume

Total saw-timber volume, as compiled in the reinventory, amounts to about 641 million board feet, log scale, Scribner rule. This includes the volume of all conifer trees 16 inches d.b.h. and larger, and the volume of all hardwood trees 12 inches d.b.h. and larger. Distribution of this volume by species and ownership class is given in table 5.

Douglas-fir constitutes 96 percent of the saw-timber volume, with 26 percent in large old-growth trees (40 inches or more in d.b.h.), 32 percent in large second-growth trees (22 to 40 inches d.b.h.) and 38 percent in small second-growth trees (6 to 20 inches d.b.h.). Grand fir, western redcedar, and red alder each comprise about one percent of the saw-timber volume, and the remaining one percent is made up of small amounts of western hemlock, noble fir, bigleaf maple, black cottonwood, and Oregon ash. Twenty-eight percent of the county's saw-timber volume including one-quarter of the large second-growth Douglas-fir, two-fifths of the small second-growth Douglas-fir and one-third of the hardwood volume is contained in the forest areas of the agricultural zone.

Forest Ownership

Ownership of the forest land in Clark County is less complicated than that usually encountered in western Washington counties. Seventy-six percent of the forest area, (tables 1 & 2), and 86 percent of the saw-timber volume (table 5), is privately owned. Included in private ownership is four-fifths of the area supporting forest growth and three-fifths of the area in nonrestocked burns and cutovers. With the exception of one large block of about 35,000 acres, individual private holdings are small and seldom include more than a few hundred acres.

Twenty-one percent of the forest land and 13 percent of the saw-timber volume is owned by the State of Washington. State lands include large blocks of tax-reverted land recently transferred from county to state ownership as well as many of the original school grant lands. Slightly over one-third of the lands currently deforested are state owned.

About two percent of the forest land is owned by the Federal Government, one-third in scattered tracts of the Columbia National Forest, and the remainder largely in the Camp Bonneville Military Reservation. Watershed lands of the city of Camas located near the headwaters of the Little Washougal River make up the remaining one percent of the forest land in Clark County.

Forest Depletion

Records on sawlog production for Clark County are not available for the years prior to 1925, but forest survey cut-over records indicate that the peak in log production was reached before 1920. Of about 100,000 acres cut over to date, three-quarters had been logged by that time. Since 1925, sawlog production has fluctuated widely, reflecting

both the general economic conditions and the growing scarcity of merchantable saw timber in the county. From an average yearly cut of 58 million board feet for the period 1925-29, sawlog production declined to an average of only 13 million board feet for the early depression years, 1930-34. During the 9 years, 1935-43, the annual cut has averaged 18.5 million board feet, but yearly variations have been pronounced. Production dropped from 29 million board feet in 1937 to only 7 million board feet in 1938, and rose from 12 million board feet in 1942 to 35 million board feet in 1943. The small size and temporary character of most of the logging operations account for a large part of this variation.

The cutting of forest products other than sawlogs, such as posts, poles, piling, fuelwood, and pulpwood, has added substantially to the annual drain on the county's forests. An estimate for the year 1930 placed the production of these products at about 12 million board feet from trees of sawlog size in addition to $1\frac{1}{4}$ million cubic feet from trees of less than saw-timber size. Fuelwood comprised about 85 percent of this volume. With a population increase of about 25 percent from 1930 to 1940, and a very large additional increase during the war, the cut of fuelwood and other minor forest products in Clark County has probably increased to at least 15 million board feet yearly. With annual sawlog production averaging 19.5 million board feet during the last four years, 1940-43, annual depletion from all trees of saw-timber size is estimated to be in the neighborhood of 34.5 million board feet.

Saw-timber depletion resulting from fires has been relatively light during the past ten years, with only 200 acres of merchantable timber burned over during the period. Likewise, no serious losses from insect or fungus attacks have been sustained.

Forest Growth

In estimating the present rate at which the forests of Clark County are growing, it was assumed that any increment on the 6,000 acres of old-growth stands is about offset by mortality and decay, and that total growth is represented by the net increment of the young growing stands (under 160 years) which cover about 167,000 acres. On this basis, total conifer growth was estimated to be 30 million board feet annually for trees 16 inches and larger d.b.h., or about 12 million cubic feet for all trees 6 inches and larger d.b.h. Annual hardwood growth for trees 12 inches d.b.h. and larger was computed to be one million board feet, placing the total growth for all stands at about 31 million board feet, yearly.

A measure of the growth that could be obtained if all forest lands in the county were occupied by well-stocked, thrifty stands is found in another growth estimate--potential annual growth. In this computation, all conifer lands in the county were assumed to be occupied by immature stands averaging 75 percent of full stocking and with all age classes up to rotation age equally represented. If these conditions were met, annual conifer growth would be in the neighborhood of 107 million board feet for all trees 16 inches d.b.h. and larger, or 29 million cubic feet

	1931	1943	Change
Generalized forest types (in thousands of acres)			
Conifers of saw-timber size	20	16	- 20%
Small second-growth conifers	47	70	+ 49%
Conifer seedlings and saplings	41	80	+ 95%
Hardwoods	9	7	- 22%
Deforested lands	110	68	- 38%
Total	227	241	+ 6%
Forest ownership (in thousands of acres)			
Private	189	185	- 3%
State	21	51	+143%
County	12	0	-100%
Federal	4	4	0%
Municipal	1	1	0%
Total	227	241	+ 6%
Saw-timber volume (in millions of board feet)			
Old-growth conifers	295	178	- 40%
Large second-growth conifers	264	212	- 20%
Small second-growth conifers	110	243	+121%
Total conifers	669	633	- 5%

Significant among the changes in forest type area during the 12-year period are: A substantial reduction in saw-timber area, a very large reduction in the area of deforested lands, and a proportionate increase in the acreage of seedling, sapling, and pole-size stands. The total forest land area has increased by about 14,000 acres, due in part to farm abandonment in the foothill zone and partly to the reclassification in the reinventory of a number of stump-pasture areas from non-forest to forest status.

The most pronounced change in forest ownership has resulted from the recent transfer of practically all the tax reverted forest lands from the county to the State of Washington to be used for state forest purposes. The area of state-owned forest land has more than doubled in the interim between inventories. Private and Federal ownerships have remained about the same.

While total volume of conifer saw timber has declined only 5 percent between 1931 and 1943, the volume reduction in trees of large size and good quality has been much greater--39 percent for old-growth timber and 20 percent for large second-growth timber. During the same period the saw-timber volume in small second-growth conifers has more than doubled. Although growth in the pole-size stands accounts for some of the gain, a large part is due to a reclassification of forest site quality. In computing the volume of second-growth conifers for the 1931 statistics, it was assumed that all forest areas of the agricultural zone were site class III. Seventy-two percent of these lands, by area, was classified as site class II in the reinventory.

for all trees 6 inches d.b.h. and larger. These figures are indicative of the increased growth possible under intensive management--3½ times the present rate in terms of board foot volume, and 2½ times the present rate in terms of cubic foot volume.

Forest Industries

A measure of the importance of forest industry in the economy of Clark County is found in the census figures for 1940. In that pre-war year 21 percent of the 17,000 workers in the county were engaged in the conversion or manufacture of forest products. Within the forest industry group three-fifths worked in pulp and paper mills, three-tenths in sawmills or wood remanufacturing plants, and one-tenth in logging operations.

During the 19-year period for which records are available (1925-43) annual lumber production in Clark County has averaged 80 million board feet. The highest yearly cut during this period (140 million board feet) was reached in 1929 and the lowest (33 million board feet) occurred in 1932. In 1943, the 23 active mills in the county produced 91 million board feet. Four large Vancouver mills, with a combined daily capacity of about 385,000 board feet, account for over half of the county's lumber production. The remaining mills, which are widely scattered throughout the county, are relatively small with rated capacities of between 5 and 15 thousand board feet per 8-hour shift.

Two pulp and paper mills, one located at Vancouver and one at Camas, have a combined daily capacity of about 850 tons of pulp and 550 tons of paper. The mill at Camas holds the distinction of being the largest producer of specialty papers in the world. Other wood-using concerns include a plywood plant with an annual capacity of 72 million square feet and several small plants manufacturing millwork, cabinet work, doors, or pattern stock.

The wood-using industries have for many years been dependent upon sources outside the county for the bulk of their raw material. The county's forests currently furnish only about one-fifth of the volume of sawlogs used by the sawmills and very few of the peeler logs used in plywood manufacture. Containing only small quantities of the pulp species--hemlock, grand fir, or spruce--the county's forests have likewise furnished only a very small fraction of the vast quantity of raw material consumed annually by the pulp and paper mills.

Comparison of Inventories

Some of the recent trends in the forest situation in Clark County are apparent in the following comparison of the findings of the 1943 reinventory with those of the original survey in 1931:

	1931	1943	Change
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Forest Industries

A measure of the importance of forest industry in the economy of Clark County is found in the census figures for 1940. In that pre-war year 21 percent of the 17,000 workers in the county were engaged in the conversion or manufacture of forest products. Within the forest industry group three-fifths worked in pulp and paper mills, three-tenths in sawmills or wood remanufacturing plants, and one-tenth in logging operations.

During the 19-year period for which records are available (1925-43) annual lumber production in Clark County has averaged 80 million board feet. The highest yearly cut during this period (140 million board feet) was reached in 1929 and the lowest (33 million board feet) occurred in 1932. In 1943, the 23 active mills in the county produced 91 million board feet. Four large Vancouver mills, with a combined daily capacity of about 385,000 board feet, account for over half of the county's lumber production. The remaining mills, which are widely scattered throughout the county, are relatively small with rated capacities of between 5 and 15 thousand board feet per 8-hour shift.

Two pulp and paper mills, one located at Vancouver and one at Camas, have a combined daily capacity of about 850 tons of pulp and 550 tons of paper. The mill at Camas holds the distinction of being the largest producer of specialty papers in the world. Other wood-using concerns include a plywood plant with an annual capacity of 72 million square feet and several small plants manufacturing millwork, cabinet work, doors, or pattern stock.

The wood-using industries have for many years been dependent upon sources outside the county for the bulk of their raw material. The county's forests currently furnish only about one-fifth of the volume of sawlogs used by the sawmills and very few of the peeler logs used in plywood manufacture. Containing only small quantities of the pulp species--hemlock, grand fir, or spruce--the county's forests have likewise furnished only a very small fraction of the vast quantity of raw material consumed annually by the pulp and paper mills.

Comparison of Inventories

Some of the recent trends in the forest situation in Clark County are apparent in the following comparison of the findings of the 1943 reinventory with those of the original survey in 1931:

	1931	1943	Change
Generalized forest types (in thousands of acres)			
Conifers of saw-timber size	20	16	- 20%
Small second-growth conifers	47	70	+ 49%
Conifer seedlings and saplings	41	80	+ 95%
Hardwoods	9	7	- 22%
Deforested lands	110	68	- 38%
Total	227	241	+ 6%
Forest ownership (in thousands of acres)			
Private	189	185	- 3%
State	21	51	+143%
County	12	0	-100%
Federal	4	4	0%
Municipal	1	1	0%
Total	227	241	+ 6%
Saw-timber volume (in millions of board feet)			
Old-growth conifers	295	178	- 40%
Large second-growth conifers	264	212	- 20%
Small second-growth conifers	110	243	+121%
Total conifers	669	633	- 5%

Significant among the changes in forest type area during the 12-year period are: A substantial reduction in saw-timber area, a very large reduction in the area of deforested lands, and a proportionate increase in the acreage of seedling, sapling, and pole-size stands. The total forest land area has increased by about 14,000 acres, due in part to farm abandonment in the foothill zone and partly to the reclassification in the reinventory of a number of stump-pasture areas from non-forest to forest status.

The most pronounced change in forest ownership has resulted from the recent transfer of practically all the tax reverted forest lands from the county to the State of Washington to be used for state forest purposes. The area of state-owned forest land has more than doubled in the interim between inventories. Private and Federal ownerships have remained about the same.

While total volume of conifer saw timber has declined only 5 percent between 1931 and 1943, the volume reduction in trees of large size and good quality has been much greater--39 percent for old-growth timber and 20 percent for large second-growth timber. During the same period the saw-timber volume in small second-growth conifers has more than doubled. Although growth in the pole-size stands accounts for some of the gain, a large part is due to a reclassification of forest site quality. In computing the volume of second-growth conifers for the 1931 statistics, it was assumed that all forest areas of the agricultural zone were site class III. Seventy-two percent of these lands, by area, was classified as site class II in the reinventory.

The Forest Situation Summarized

In the main forest zone the forest resource is currently very depleted, with a relatively small area and volume of merchantable saw timber, a scarcity of immature stands that are approaching saw-timber size and quality, and a very large acreage of nonproductive deforested land. If sawlog production continues at the present very low rate, the saw timber now available may last from 10 to 20 years, but the outlook for the county's logging industry is, in general, not encouraging.

Restoration of the forest zone to a high state of productivity presents the major forest problem in the county. It will entail a large-scale program of forest rehabilitation including fire hazard reduction and intensified fire protection for the areas where the fire hazard remains high, and extensive forest planting for the areas where adequate natural restocking is unlikely. Justification for such a program is found in the high productive capacity of the forest land, its accessibility, and its proximity to the wood-using industries of the Portland-Vancouver area.

In the scattered forest areas of the agricultural zone, opportunities for continuous forest production are more favorable. The bulk of the stands are of pole size or larger, tree density is generally high, and fire hazard conditions are relatively light. Although these stands have in recent years furnished a large portion of the fuel wood cut in the county, cut-over areas usually restock promptly and forest growth appears to be keeping pace with cutting depletion. Under present cutting practices, many stands of potential saw-timber value are prematurely cut for fuelwood and other minor products of relatively low value. The volume of timber yields could be increased materially and the quality of forest products greatly improved if more intensive forest management practices were generally adopted in the agricultural zone. The year-round accessibiltiy of the farm forests, and their nearness to urban centers with a ready market for all types of wood products should make such practices both feasible and profitable. The possibilities of increasing the income from farm forests through the formation of farm forest cooperatives also warrant consideration.

Table 1.--Area, in acres, of all forest cover types, by ownership class

Data corrected to July 1, 1943

Type No.	Type	Private	State available	Municipal	Federal			Total
					Available		Reserved	
					National forest	Public domain	Military reserve	
4	Woodland: Oak	105						105
	Douglas-fir							
6	Large old growth	4,490	1,360		45			5,895
7	Small old growth	275						275
8	Large second growth	8,575	1,370		80			10,025
9	Small second growth	57,920	9,390		200		370	67,880
10	Seedlings and saplings	63,325	15,930		545		55	79,855
19	Western redcedar, small	1,310						1,310
30	Grand fir, small	965						965
	Hardwood							
31.5	Large	385	15					400
31	Small	6,515	300					6,815
	Nonrestocked cutover							
35	Cut prior to 1920	7,500	1,320	120				8,940
35A	Cut from 1920-29 incl.	4,770	425					5,195
36	Recent cutover, since 1930	6,675	1,485					8,160
37	Deforested burn	21,635	19,890	1,255	570	40	2,075	45,465
	Total forest types	184,445	51,485	1,375	1,440	40	2,500	241,285
	Nonforest land							
3	In agricultural use	145,570	785					146,355
2	Other	17,560					520	18,080
	Total	347,575	52,270	1,375	1,440	40	3,020	405,720

Table 2.--Area, in acres of generalized forest types, by ownership class

Data corrected to July 1, 1943

Type definition	Private	State available	Municipal	Federal			Total
				Available		Reserved	
				National forest	Public domain	Military reservation	
Conifer saw timber types 6, 7, and 8	13,340	2,730		125			16,195
Conifer second growth types 9, 19, and 30 on cut-over areas	31,035	1,405					32,440
on old burns	28,625	7,985		200		370	37,180
Total	59,660	9,390		200		370	69,620
Conifer seedlings and saplings types 10 and 19 on cut-over areas	46,345	2,875		125			49,345
on old burns	17,515	13,055		420		55	31,045
Total	63,860	15,930		545		55	80,390
Recent cut-over areas type 36	6,675	1,485					8,160
Nonrestocked cut-over and burned over areas types 35, 35A, and 37	33,905	21,635	1,375	570	40	2,075	59,600
Hardwoods types 31 and 31.5	6,900	315					7,215
Noncommercial areas type 4	105						105
Total forest types	184,445	51,485	1,375	1,440	40	2,500	241,285
Nonforest land types 2 and 3	163,130	785				520	164,435
Total	347,575	52,270	1,375	1,440	40	3,020	405,720

Table 3.--Area, in acres, of certain immature conifer types by age class and degree of stocking

Data corrected to July 1, 1943

Age class (years)	Degree of stocking	Type number and name: 10 Douglas-fir seedlings and saplings	9 Douglas-fir small second growth	19 Western redcedar second growth	30 Grand fir second growth	TOTAL
10	Good	3,370				3,370
	Medium	24,885				24,885
	Poor	32,215				32,215
	Total	60,470				60,470
20	Good	4,330	1,520			5,850
	Medium	9,655	6,210			15,865
	Poor	4,375	1,680	535		6,590
	Total	18,360	9,410	535		28,305
30	Good		9,225			9,225
	Medium	1,025	5,990			7,015
	Poor		2,955			2,955
	Total	1,025	18,170			19,195
40	Good		4,885		690	5,575
	Medium		5,510			5,510
	Poor		1,795			1,795
	Total		12,190		690	12,880
50	Good		7,370	775		8,145
	Medium		6,990			6,990
	Poor		1,835			1,835
	Total		16,195	775		16,970
60	Good		3,775			3,775
	Medium		4,400			4,400
	Poor		770			770
	Total		8,945			8,945
70	Good		1,215			1,215
	Medium		1,550			1,550
	Poor		205			205
	Total		2,970			2,970
90	Good					
	Medium				275	275
	Poor					
	Total				275	275
Total all ages	Good	7,700	27,990	775	690	37,155
	Medium	35,565	30,650		275	66,490
	Poor	36,590	9,240	535		46,365
	Total	79,855	67,880	1,310	965	150,010

Table 4.--Land areas, forest land areas, and commercial conifer areas, by site quality class 1/

Data corrected to July 1, 1943

Kind of forest land and site quality class	Total Area		Area in forest land	Area in commercial conifers
	Acres	Percent	Percent	Percent
Commercial conifer				
Douglas-fir				
Class I	3,475	0.9	1.5	1.5
Class II	179,605	44.3	74.4	76.8
Class III	47,585	11.7	19.7	20.3
Class IV	3,300	0.8	1.4	1.4
Total commercial conifer	233,965	57.7	97.0	100.0
Hardwood	7,215	1.8	3.0	
Oak woodland	105			
Total other	7,320	1.8	3.0	
All forest land	241,285	59.5	100.0	
Nonforest land	164,435	40.5		
GRAND TOTAL	405,720	100.0		

1/ The "site quality" of a forest area is its relative productive capacity determined by climatic, soil, topographic, and other factors. The index of site quality is the average height of the dominant stand at the age of 100 years. Five site quality classes are recognized for Douglas-fir types, Class I being the highest. In the survey Douglas-fir classifications were used not only for types in which this species is dominant but also for other types for which no site quality classifications have been developed.

Table 5.--Volume of timber by species and ownership class

Data corrected to July 1, 1943

Trees 16" and more d.b.h. 1/
Thousands of board feet, log scale, Scribner rule

Species	Private	State Available	Federal		Total
			Available National Forest	Reserved Military Reservation	
Douglas-fir	129,550	31,976	1,175		162,701
Large old growth	2,760				2,760
Small old growth	181,315	24,749	1,806		207,870
Large second growth	217,004	25,277	503	9	242,793
Small second growth					
Western hemlock	1,731	288			2,019
Large					
Western redcedar	5,892	191			6,083
Live		200			200
Noble fir	8,548				8,548
Grand fir	5,138	832	21		5,991
Red alder	691	41	3		735
Bigleaf maple	940				940
Northern black cottonwood	207				207
Oregon ash					
Total	553,776	83,554	3,508	9	640,847

1/ Trees of hardwood species taken from 12" and more d.b.h.